



SIERRA LEONE

ANNUAL REPORT
OF THE
Department of Agriculture
FOR THE YEAR
1951

Price—1s. 6d.

FREETOWN :

PRINTED AND PUBLISHED BY THE GOVERNMENT PRINTER, SIERRA LEONE
*To be purchased from the C.M.S. Bookshop, Oxford Street, Freetown and from the
Crown Agents for the Colonies, 4 Millbank, London, S.W. 1.*

1953

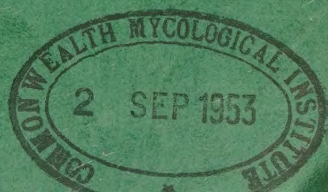


TABLE OF CONTENTS

	PAGE
SECTION I—INTRODUCTION AND POLICY :	
A—THE ADEQUATE PROVISION OF FOOD FOR THE PEOPLE	2
B—THE CULTIVATION OF CASH CROPS AND THE EXPLOITATION OF WILD TREES FOR EXPORT PURPOSES	5
C—SOIL CONSERVATION	6
D—THE IMPROVEMENT IN PREPARATION, QUALITY AND MARKETING OF PRODUCE	6
E—AGRICULTURAL EDUCATION	6
F—RESEARCH	7
SECTION II—THE WORK OF THE DEPARTMENT OF AGRICULTURE:	
(a) ORGANISATION AND STAFF	7
(b) AGRICULTURAL CIRCLES:	
South-western Circle	7
Scarcies Circle	10
South-eastern Circle	12
Bonthe Circle	13
Makeni Circle	14
Musaia Circle	15
Colony Circle	17
(c) NJALA COLLEGE FARM	19
(d) HORTICULTURAL SECTION	20
(e) RESEARCH:	
Plant Pathology Section	21
Agricultural Chemistry Section	23
Systematic Botany and Ecology Section	24

Department of Agriculture

SENIOR STAFF AT 31st DECEMBER, 1951

DIRECTOR:

G. W. Lines, M.B.E., M.A., Dip. Agri. sci. (Cantab)

DEPUTY DIRECTOR:

A. F. MacKenzie, B.Sc., (Hons.), (Lond.), A.R.C.S., A.I.C.T.A.

SECRETARY:

J. E. O. Jones

RESEARCH OFFICERS:

Plant Pathologist:

F. C. Deighton, O.B.E., M.A. (Cantab.)

Entomologist:

F. A. Squire, B.Sc. (South Africa), A.I.C.T.A.

Agricultural Chemist:

C. J. Piggott, B.Sc., Agri. (Reading), Dip. Agri. sci. (Cantab.) D.T.A. (Trinidad)

Systematic Botanist and Ecologist:

D. Small, B.Sc., Bot. (Belfast), B.Sc. For. (Edin.)

FIELD STAFF:

Agricultural Officers:

E. I. Nisbett, Dip. Hort. (Reading)

R. M. Steven, Dip. I.C.T.A.

P. Adames, M.A. (Oxon.), A.I.C.T.A.

H. D. Jordan, B.Sc. (Hons.) (Lond.), A.R.C.S., A.I.C.T.A.

J. M. Dent, B.Sc. (St. Andrews), A.I.C.T.A.

T. S. Jones, B.Sc. (Agri.) (Reading), A.I.C.T.A.

E. H. Nichols, B.Sc. (Agri.) (Dunelm), Dip. Agri. (Cantab.), A.I.C.T.A.

H. J. Williams, N.D.A.

J. D. A. Harris, B.Sc. (Hons.) (Wales), D.T.A. (Trinidad)

A. S. MacDonald, B.Sc. (Agri.) (Dunelm), D.T.A. (Trinidad)

G. C. Taylor, B.Agri. (Hampton), B.Sc. (Agri.) Tuskegee, M.Ed. (Rutgers)

Horticulturist:

H. D. Tindall, B.Sc. (Hort.) (Reading), N.D.H., A.I.P.A.

Agricultural Superintendents:

A. S. Kerton

Temporary Agricultural Superintendents:

J. C. Rippey, B.Agri. (Belfast)

J. R. Wells, B.Sc. (Agri.) (Leeds)

J. M. Oliphant, B.A. Agri. (Oxon.)

K. Miszewski, B.A. Agri. (Cantab.)

J. J. F. Glass, M.I.B.A.E.

W. Macnab, N.D.A., N.D.D.

Annual Report of the Department of Agriculture for the Year 1951

SECTION I—INTRODUCTION AND POLICY

The staff position deteriorated during the year. Three Agricultural Officers were transferred to other territories, one resigned, and one transferred to another department. These losses were mitigated by the arrival of four Temporary Agricultural Superintendents, together with a new Agricultural Chemist to replace the previous one who was transferred to another territory.

2. Good progress was made in implementing District Economic Plans. Agricultural Officers in charge of Circles gave advice and assistance on agricultural matters, in addition to pressing forward the development work undertaken by the department. A notable achievement was the ploughing by mechanical means of 282 acres of grassland in Bonthe Circle and 80 acres in Rokupr Circle, all highly suitable for rice growing, and not previously cultivated. As a result, plans were made during the year for large-scale tractor ploughing in virgin swamp grasslands early in 1952. Eighteen Fordson County tractors and disc ploughs were indented for on behalf of Government and three more for District Councils, and a Mechanical Superintendent arrived at the end of the year. This mechanized production of swamp rice, together with experimentation and extension with fertilizers, and the extension of the livestock and pig industries, will form the basis of policy for the department for the immediate future and, it is hoped, for many years to come.

3. The policy of developing swamps for rice growing, and conserving the upland soils by encouraging the planting of permanent crops, has continued. The planting of improved oil-palms made good progress. Work in cocoa areas on the preparation of the crop for market and destruction of pests continued actively.

4. Construction of the Rice Research Station at Rokupr was again delayed by lack of materials, and in consequence the recruitment of specialist staff was postponed.

5. This year saw a further extension of the work on empoldering areas normally too saline for rice growing.

6. Mangrove felling in the Bonthe area continued steadily, and inland swamp schemes worked satisfactorily. It seems, however, that more rapid results may be expected from the Mechanical Cultivation Scheme.

7. Livestock improvement was continued at Musaia with cattle, and at Newton with pigs and poultry. Good progress was made, though some difficulty was experienced in breeding imported geese and ducks.

8. Chemical research on soil problems suffered a minor setback due to a change of staff. In spite of this, some interesting results have emerged from fertilizer trials on various crops.

9. The Plant Pathologist and Entomologist maintained their vigilance on diseases and pests of crops. The Systematic Botanist and Ecologist took over the herbarium and was mainly engaged on collection work.

10. At the Njala Training College, the training of junior staff continued with more emphasis than usual on practical work in the field, and upon pigs, poultry, mechanization and fertilizers.

11. One ex-student completed his studies satisfactorily at Reading and proceeded to the Imperial College of Tropical Agriculture in Trinidad.

12. Weather conditions in 1951 were very favourable. The rains began a little early and continued steadily to a later date than usual. There were no remarkably dry spells, and little damage from flooding. A most unusual occurrence was a heavy shower of rain in January.

13. Exports of Agricultural produce amounted to 94,738 tons valued at £6,766,666, compared with 88,440 tons valued at £3,649,097 in the previous year.

A—THE ADEQUATE PROVISION OF FOOD FOR THE PEOPLE

This is to be accomplished by the improvement and spread of swamp rice cultivation to such an extent that not only will the needs of the people be supplied in a bad year but there will be a surplus for export in ordinary years.

14. *Mangrove Swamp Reclamation.*—The development of mangrove areas where fresh water conditions prevail for a sufficiently long time to allow rice to be grown is mainly concentrated in the Bonthe and Moyamba Districts.

15. By the end of 1951, 1,243 farmers had received loans and had cleared 4,431 acres and 786 farmers had cleared 3,771 acres without financial assistance. Native Administrations had cleared 143 acres. Development is naturally slow, but is progressing steadily year by year. Now that the way has been shown, it is intended that further work should be done under the auspices of District Councils.

16. *Saline Swamp Reclamation.*—In the Scarcies area, the 105 acres empoldered in 1949 and 1950 were planted with rice and very satisfactory crops were obtained. The scheme was extended by a further 100 acres by the Public Works Department (Irrigation and Drainage Branch). Another 130 acres was empoldered under the supervision of this department in another chiefdom, making a total of 335 acres. This is now financed and administered by the Kambia District Council.

17. At Maswari, in the Eastern Colony area, yields of 1,500 lb. of paddy per acre were obtained with the use of fertilizers. Farmers' plots without fertilizer gave from 720 to 1,000 lb. of paddy per acre. Despite these rather low yields, there is a big demand for land inside the empoldered area.

18. Wellington empolder grew 25 acres of rice this year, giving yields of 600 to 1,200 lb. of paddy per acre. The addition of 3 tons of lime per acre was effective in bad areas but it was uneconomic.

19. A small area was flooded by diverting a stream, and good yields were obtained. Unfortunately, the stream is not big enough to flood the whole area, which still remains a problem.

20. *Inland Swamp Cultivation.*—The cultivation of inland swamps has continued to extend in the vicinity of large towns and elsewhere. An increase in the price of rice has stimulated interest in these swamps. The figures for the acreage cleared under Native Administration auspices are:—

Circle	1946	1947	1948	1949	1950	1951
Makeni	55	127	155	214	241	245
Rokupr	—	23	32	38	47	117
Kenema	—	64	34	74	74	74

21. Yields naturally are very variable, ranging from 700 to 1,300 lb of paddy per acre, but these are considerably better than those obtainable on the adjacent upland.

22. *Mechanised Cultivation of Swamps.*—Following trials made in 1949 and 1950, a Fordson County tractor on full-tracks was imported for use in the Bonthe Riverain Grasslands. In the course of the dry season, a total of 282 acres was ploughed at five different sites.

23. One of the chief difficulties was to obtain a sufficiently large area of cleared land for the tractor to work on. Clearing was done by the farmers, and they found it beyond their power to keep ahead with the work. It is plain that in this area a mechanised method will have to be used to deal with the coarse and heavy growth of swamp grasses.

24. A Ransomes Hussar disc plough was used, and though it did satisfactory work, a heavier one with larger discs would however have been better.

25. No implement was available until late in the season for breaking down the ploughed land. A Wilder Pitch-pole heavy duty harrow was used on 48 acres and this was very successful.

26. Unfortunately, the rains started earlier than usual this year, and in consequence about 40 acres were lost for cultivation owing to too early flooding. The rest of the area was planted with Indo-China deep water rice, and very good yields were obtained, the average being in the region of 1,800 lb of paddy per acre. Trials with five selected strains of Indo-China are showing two as outstanding, giving yields of around 1½ tons of paddy per acre.

27. At Mange, in Port Loko District, 80 acres of a small riverain swamp were ploughed, using a Fordson Major tractor on half-tracks and a Ransomes Hussar disc plough. The ploughing was followed by a single harrowing with a weighted set of Ransomes Countess disc harrows. This produced an excellent seed bed.

28. Early flooding, as in Bonthe, resulted in the loss of nineteen acres, but the remainder grew good crops of various rices suited to different depths of flooding.

29. Progress in the cultivation of riverain swamps has been as follows:—

<i>Circle</i>	1949	1950	1951
Bonthe	4	70	282
Rokupr	—	—	80

30. *Swamp Rice Seed Distribution.*—Selected farmers were encouraged to grow pure seed rice for purchase and re-sale by the department at a premium of sixpence to one shilling per bushel over the current market price. A total of 1,487 bushels (89,220 lb) were sold to farmers.

31. *Better Cultivation of Inland Swamps for Crops other than Rice during the Dry Season.*—The distribution of suitable planting materials continued as usual, both from Departmental and Native Administration farms.

32. In the North, there has been an increase in dry season cultivation, and farmers are being encouraged to cultivate their swamps as early as possible after the end of the rains. The use of oxen for this purpose is being encouraged.

33. The Model Holdings at Newton and Kamakwie are succeeding well and making a reasonable profit by intensive methods of cultivation.

34. *The Extension of Garden and Small Field Crops to serve as an Auxiliary Food Supply.*—The appointment of a Horticulturist has provided a stimulus to the Colony vegetable growers, who have not hitherto had the advantage of special attention.

35. In the region of large towns, vegetable growing is very lucrative, and it is expected that the Horticulturist will extend his activities to other parts of the country in future years.

36. *The Improvement of Livestock*.—At Musaia, the Animal Husbandry Station is now practically complete so far as buildings are concerned. The real work of the station is benefiting accordingly, and more attention can be paid to both animals and crops. Pigs and poultry have been introduced from Newton and are thriving.

37. At the end of the year there were 156 herd of Ndama cattle: 77 in the beef herd and 79 in the dairy herd. The beef herd has continued to do well under range conditions. It has been found that they put on weight from February to September, with little increase for the rest of the year, the rate of gain is about 17 lb. per head per month.

38. The milk production of the dairy herd was greater than in 1950, but the average length and production per lactation was less owing to an increasing proportion of heifers and two incomplete lactations.

39. All the cattle were inoculated against Rinderpest and although some trouble was experienced with young calves, their health was good throughout the year.

40. Cattle kept at other stations have also done well.

41. *Pigs*.—Among the Colony farmers, pig keeping declined slightly. The main difficulty for them is to obtain adequate supplies of cheap concentrates.

42. At Newton the pedigree and hybrid Large Whites have continued to thrive. An imported Wessex Saddleback boar and one sow in-pig died from Trypanosomiasis.

43. Another animal was affected with the disease, but an injection of Antiricid effected a rapid and permanent cure. All pigs now receive prophylactic treatment.

44. *Small Livestock*.—Rabbits at Newton and Njala, and guinea pigs at Newton, have increased in numbers satisfactorily, though perhaps not quite with the rapidity with which they are customarily credited.

45. Animals have been supplied both to the Veterinary and Medical Departments for laboratory use, and to the public for breeding purposes.

46. *Poultry*.—Rhode Island Red fowls were reared mainly at Newton and Njala for supply to local applicants. Production and distribution during the year showed marked improvement compared with 1950.

			Eggs Laid	Eggs Incu- bated	Eggs for Hatching	Birds sold for Breeding
Njala	..	..	1,461	1,461	921	90
Newton	..	..	7,065	1,276	2,781	110
Total	..	..	8,526	2,737	3,702	200

47. Muscovy ducks did well. They are slow-maturing and do not lay well. Nevertheless they have done better than imported Khaki Campbell and Indian Runner ducks, which will not breed satisfactorily.

48. Chinese geese did well, but were shy breeders. A high proportion of the eggs were infertile and it seems that this was due to the absence of a pond for them to mate in and to keeping the eggs too long before setting them. By the end of the year, the original stock of twelve birds had increased to forty.

**B—THE CULTIVATION OF CASH CROPS AND THE EXPLOITATION OF WILD TREES
FOR EXPORT PURPOSES**

49. The following table gives comparative figures of Agricultural exports in recent years:—

<i>Products</i>	1938	1948	1949	1950	1951
PALM KERNELS					
Quantity, tons	63,697	66,431	76,541	71,269	75,102
Value ..	£457,031	£1,744,591	£2,314,038	£2,277,752	£4,549,773
Price ..	£7	£26	£30	£32	£61
PALM OIL					
Quantity,	1,066	2,208	3,308	1,940	3,191
Value ..	£16,025	£115,958	£186,348	£105,411	£260,844
Price ..	£15	£52	£56	£54	£81
PIASSAVA					
Quantity, tons	3,791	2,159	2,785	5,348	6,153
Value ..	£40,369	£88,345	£118,744	£273,336	£283,010
Price ..	£10	£41	£43	£51	£46
GINGER					
Quantity,	2,705	1,318	1,395	2,383	3,251
Value ..	£60,680	£73,682	£146,791	£563,535	£772,388
Price ..	£22	£56	£105	£237	£241
COFFEE					
Quantity,	38	347	257	317	1
Value ..	£793	£19,148	£17,165	£39,092	£216
Price ..	£21	£55	£67	£123	£216
COCOA					
Quantity,	384	1,379	714	1,620	1,811
Value ..	£5,849	£102,941	£65,627	£117,212	£525,974
Price ..	£15	£75	£92	£72	£290
KOLA					
Quantity,	1,450	1,840	1,680	1,070	1,564
Value ..	£29,785	£166,635	£155,216	£106,244	£181,974
Price ..	£20	£91	£92	£99	£116
BENNISEED					
Quantity,	374	350	287	804	46
Value ..	£3,700	£11,538	£10,728	£33,811	£3,073
Price ..	£10	£33	£37	£42	£67
GROUNDNUTS					
Quantity,	Nil	890	2,454	3,465	3,619
Value ..	—	£26,588	£71,639	£100,011	£189,414
Price ..	—	£30	£29	£29	£52
Total Tonnage					
All Exports ..	73,505	76,961	89,421	88,216	94,738
Total Value					
All Exports ..	£614,232	£2,351,920	£3,086,296	£3,616,404	£6,766,666

Note:—Quantities are quoted in tons. Prices are the average ruling prices during each year. These figures are quoted from export statistics, the actual monetary value to the producer would be two-thirds of these figures.

50. The value of all agricultural produce, with the exception of piassava, rose steeply. Palm kernels, palm oil, and groundnuts nearly doubled in price, but the most spectacular change was in the price of cocoa which in 1950 was worth £72 per ton and this year fetched £290. There has been a general increase in production but it has not been proportional to the increased prices. Coffee exports by recognised routes were negligible, but the interest shown in new plantations, and the high price in neighbouring territory, suggest that there has been no decline in production.

51. The response to the increased prices will not become fully apparent for another year. The production of ginger illustrates this point, but it does not follow that all increases will be of the same order.

C—SOIL CONSERVATION

52. The expansion in the development of inland, saline and mangrove swamps, has been pressed forward as in previous years, thus providing some relief to the pressure of farming on the uplands. The planting of oil-palms and trials in the use of fertilizers are also directed to this end.

53. The early burning of grasslands was carried out extensively this year. The early burns proved less damaging to trees than late ones and if a second burn occurred, it was less intense than it would have been had there been no previous fire. It is as yet too early to see any effects on the regeneration of tree species, but it is plain that the chances of survival of existing trees have been greatly improved.

54. The practice of early burning fits in with normal practice among the cattle owners in the northern parts of the country. They would, however, prefer a succession of burns, to provide a succession of young grass.

55. The recommendations of the Soil Conservation Team, whose report has now been published, are being studied for implementation. It seems clear that the grassland areas in the hilly north-eastern parts of the country will need attention first.

56. The conservation of water for livestock and dry season grazing is likely to be of major importance.

D—THE IMPROVEMENT IN PREPARATION, QUALITY AND MARKETING OF PRODUCE

57. The Department of Commerce and Industry's large rice mill at Mambolo was completed in time to begin working on the 1950–51 rice crop. It is an impressive sight and appears to have had a stimulating effect on local rice planting.

58. Pioneer Oil Mills have proved successful in the South and the Produce Marketing Board is building more. One has now been built at Mange in the Northern Province, where there is a very promising belt of oil-palms.

59. The number of cocoa fermentaries was reduced from ten to eight in the 1951 season owing to lack of support from the farmers in two places. The remaining ones produced a high proportion of top grade cocoa, but needed close supervision to get it done.

60. Propaganda and instruction among piassava producers was carried out by the Department, but owing to a fall in the price, interest waned, and there was a decline in the quality, particularly in the case of Sulima piassava.

E—AGRICULTURAL EDUCATION

61. Future Agricultural Instructors continued to receive training at the Njala Training College. There were eighteen students-in-training of whom eight were in their final year and ten in their second year. An innovation this year was the establishment of a 3-year Agricultural-Education course. This is designed to train teachers who will have sufficient Agricultural training to teach gardening, simple Agriculture, Rural Science, Nature Study, Rural Crafts and Arithmetic up to Standard VII. Two students, Messrs. S. A. Kawa and A. R. Siaffa, attended the Prince of Wales School and passed their Higher School Certificate examination in December.

62. Mr. C. T. Pyne continued his Honours Degree course in Botany and Mr. J. O. Belford a general degree course in Chemistry.

63. Mr. J. A. C. Davies completed his B.Sc. course in Agriculture at Reading and was awarded a Colonial Agricultural probationership for post-graduate study at Cambridge and the Imperial College of Tropical Agriculture in Trinidad. Mr. H. O. Jarrett went to the United Kingdom to read for an Honours Degree in Agricultural Chemistry. Mr. J. C. O. Allen was seconded for a further period of duty at the S. B. Thomas Agricultural Academy at Mabang.

F—RESEARCH

64. Research in Plant Pathology, Entomology and Agricultural Chemistry continued, with the addition of Systematic Botany and Ecology.

65. Construction work on the Rice Research Station continued, and some accommodation for extra staff was completed by the end of the year. No research staff was recruited during the year, but the collection of exotic and indigenous rice varieties was enlarged, and a good start was made with breeding new varieties.

SECTION II—THE WORK OF THE DEPARTMENT OF AGRICULTURE

A—ORGANISATION AND STAFF

66. In February this year, Mr. R. R. Glanville, C.B.E., went on vacation leave and retired from the Colonial Service in June. He was succeeded in the post of Director by Mr. G. W. Lines, M.B.E., formerly Deputy Director and Mr. A. F. MacKenzie was promoted from Senior Agricultural Officer to Deputy Director. Mr. S. M. Taylor transferred to the Department of Commerce and Industry, becoming its Director. Mr. E. S. Capstick was transferred on promotion to Trinidad as Senior Agricultural Officer, Mr. A. P. MacWilliam was transferred to Nyasaland and Mr. T. P. Wheldon resigned. Mr. G. C. Taylor, who has done good work at the Njala Training College, was promoted from Agricultural Superintendent to Agricultural Officer.

67. Mr. C. J. Piggott arrived in September to take up the duties of Agricultural Chemist whose services were badly needed, and there was a welcome influx of Agricultural Superintendents in the persons of Messrs. J. M. Oliphant, K. Miszewski, J. J. F. Glass and W. Macnab.

68. The demand for Agricultural Officers remained unsatisfied; there were still five vacancies at the end of the year and the lack of officers to fill them was keenly felt. Nevertheless sound progress was made. Agricultural Officers extended the work on fertilizer trials and the foundations were laid for large-scale operations in the mechanical cultivation of rice.

69. The Horticulturist has now settled down to his work and begun to make his mark. A notable achievement is the establishment of a small co-operative marketing society among the vegetable growers in the Hill villages near Freetown.

B—AGRICULTURAL CIRCLES

South-western Circle

Experimental Station, Njala:

70. *Upland Grasses*.—Observations on exotic and local grasses were continued. *Pennisetum setosum* from the Gambia gave 40 per cent more cut grass than the local Makali strain. In the dry season, it showed reddening of the leaves, while the Makali variety remained green. Grazing cattle showed no preference.

71. Exotic strains of *Panicum maximum* (Guinea Grass) continued to do well. A further 1-acre plot of the strain C.P.I. 8389 was planted at the end of July, and it gave 7,544 lb. of cut fodder at the end of October.

72. *Leguminous Fodder Crops*.—Despite its drawbacks, *Pueraria phaseoloides* continued to be the best source of leguminous fodder, and it was included in pit silage together with different grasses. Groundnut tops were also used and the results were satisfactory.

73. *Annual Crops*.—Annual crops were grown in connection with fertilizer trials and to provide a certain amount of stock food. Groundnuts did particularly well on Block 15; the yield, without fertilizer, was 2,214 lb. of unshelled nuts per acre.

74. *Permanent Crops.*—Recording the yields of citrus, coffee and kola continued with a view to future selection work.

75. *Oil-palms.*—Propagation and selection of high-yielding strains of oil-palms continued. Palm seedlings were raised from specially selected seed received from Nigeria in 1950. Three strains of known parentage were received and 70 palms of each strain have been planted out.

76. Recording of yields from Nigerian and Angola palms continued.

77. A germinating house for oil-palm seed has been constructed. It will be heated by hot water pipes and it is expected that a higher percentage germination will be achieved.

78. 2,400 seedling oil-palms were distributed for planting in the district and also a large number of other economic and ornamental plants.

79. *Livestock: Cattle.*—The herd of Ndama cattle was maintained in good condition throughout the year. Some of the young stock were transferred to Old Njala where some extra grazing is available.

80. *Pigs.*—The herd kept free from disease and 43 pigs were sold for breeding.

81. A Wessex Saddleback boar and two gilts were transferred from Newton and also a young Large White boar to replace the old one which was slaughtered.

82. *Poultry.*—The Rhode Island Red flock was maintained, but some difficulty is still experienced in building up the flock. Mortality in young chicks was considerably reduced this year but the figure of 44 per cent is still very high. The main difficulty is to allocate sufficient skilled personal supervision in order to prevent pilfering of eggs and mishandling of young chicks.

83. Local Muscovy, Khaki Campbell and Indian Runner ducks have been kept. The imported ducks have not done very well, particularly the Indian Runners which have not yet laid a fertile egg.

84. *Rabbits.*—A new rabbit house was constructed and the numbers have increased from 8 to 23. Three were supplied to the Veterinary Department for the production of Rinderpest vaccine. A few deaths occurred which appeared to be due to impacted stomach.

Extension Work:

85. *Inland Swamp Development.*—In Bo and Moyamba Districts there has been an encouraging increase in the extension of inland swamp cultivation. It is estimated that about 900 additional acres were planted this year. The increase was stimulated by early rains which interfered with the burning of upland farms.

86. *Mechanical Cultivation.*—A trial area of 32 acres of grassland liable to flooding was tractor-ploughed. Ploughing began on May 14th and sowing was completed by May 30th. Owing to early rains, the rice on some of the lower areas was lost, but on higher ground growth was very good and farmers were well satisfied with the yields obtained.

87. *Mangrove clearing scheme.*—The scheme in Moyamba District is now administered by the District Council. The extension of cleared areas and the felling of new areas continued on the Bumpe and Ribbi rivers. An additional 46 acres were cleared, and 196 acres planted for the first time. Unassisted farmers planted 285 acres for the first time, but did no new felling.

88. *Seed Rice Production.*—Pure seed was supplied to reliable farmers in Bo and Moyamba Districts and to Native Administrations. They grew the crop and sold seed to applicants requiring seed rice. A yield of 1,975 lb per acre was realised from nine farms totalling 15½ acres.

89. *Cocoa*.—Interest in the crop was maintained and it is estimated that new plantations covered approximately 740 acres, as shown in the following table:—

<i>District</i>	<i>Acreage, 1950</i>	<i>Acreage, 1951</i>	<i>Increase</i>
Pujehun ..	2,533	*2,883	†350
Bo ..	*1,002	1,335	333
Moyamba ..	—	54	54
* No census taken		† Estimated	

90. The quality of the fermented beans has shown improvement. Most of the cocoa sold was Grade II or III with very little Grade IV.

91. Central cocoa fermentaries numbered four this year. Raw cacao was purchased at 6d. per lb. pound and the product was graded and sold. Farmers were paid a bonus at the end of the season according to the weight of wet beans they supplied and the quality of the cocoa produced. Comparative figures of purchases and sales during the last two years are given in the following table:—

<i>Year</i>	<i>Wet beans bought</i>	<i>Grade I</i>	<i>Cocoa Sold Grade II</i>	<i>Grade III</i>	<i>Grade IV</i>
1950 ..	38,582	14,609	141	—	29
1951 ..	26,426	8,766	—	—	—

92. Monkey drives were organised in Bo and Pujehun Districts and 9,600 were destroyed. Over 95 per cent belonged to species known to be destructive to cocoa.

93. *Oil-palms*.—Existing nurseries were enlarged and five new ones established. A supply of seed was organised at Masanki, and also a supplementary nursery for seedlings occurring under the palms in the plantation. The following table illustrates the progress made during the last three years:—

	<i>Seedlings in Nurseries</i>	<i>Seedlings Distributed</i>
1949 ..	10,000	4,000
1950 ..	21,000	8,604
1951 ..	140,800	21,600

94. Nut-cracking machines were established at four centres with the aid of loans from the Development of Industries Board. They appear to have been fairly successful.

95. *Piassava*.—Production in the Pujehun—Sulima area showed an increase but the quality was very variable. A demonstrator was posted to the Potoru area and quality was good in the places in which he operated. There is little incentive for producers to prepare a good quality product so long as dealers are prepared to buy a poor grade of material.

96. *Coffee*.—A sharp increase in price brought about a marked revival of interest in this crop. Old plantations were cleaned up and new ones were made, many of them with the assistance of loans from District Councils. The area of new plantations is estimated at 550 acres.

97. There was a considerable demand for coffee hullers, but importing firms seem to have made little effort to meet it.

98. *Ginger*.—There was an estimated increase of 1,800 acres under ginger in Bo District, brought about by the high price paid for the crop last year. The price this year however declined and it is unlikely that the present area under this crop will be maintained.

99. *Fertilizers*.—Fertilizer trials were carried out on rice, cassava, ginger and cocoa.

100. The effect of Superphosphate tried on transplanted rice in two inland swamps was very variable and no conclusions could be drawn. In the early stages, the crop showed visible responses to the application of Superphosphate but there was considerable damage to the experiments later by animals, which affected the yields.

101. The application of Superphosphate and Sulphate of Potash on cassava, at 2 cwt. per acre each, produced visible responses but no yield figures have yet been obtained.

102. On ginger the effects of compost, Sulphate of Ammonia, Sulphate of Potash and Superphosphate were tried. Compost at ten tons per acre produced rapid initial growth, but plots with a complete dressing of NPK in the ratio of 2:2:1 cwt. per acre soon caught up and in the end produced the greatest increase in yield of 101 per cent. This was worth approximately £39 10s. 0d. per acre nett. 2 cwt. per acre of Sulphate of Potash produced a 65 per cent increase, worth £25 10s. 0d. per acre but with less outlay.

103. On cocoa it appears that Superphosphate has the effect of increasing the number of pods per tree by reducing the Cherelle wilt. Sulphate of Potash had little effect. At 3 cwt. per acre, Superphosphate produced a 60.8 per cent increase in the number of pods and an 86.8 per cent increase in the weight of cocoa. This represents a nett profit of 1s. 3d. per tree.

SCARCIES CIRCLE

104. *Rice Research Station, Rokupr.*—Building work continued on staff quarters, but progress was slow owing to delays in the supply of materials beyond the control of this department. Buildings completed by the end of the year were one bungalow, three junior staff quarters, and improvements to an existing bungalow.

105. The recruitment of research staff was again delayed.

106. *Rice Selection.*—Work on selection and multiplication of swamp rices suitable for conditions in Sierra Leone continued.

107. The number of imported rices maintained now stands at 140. In addition 192 selected strains of local and imported rices were grown this year.

108. Eight new importations were made from Orissa, twenty from Thailand and 57 from Ceylon.

109. A number of the rices imported this year originated in countries other than those from which they were obtained, e.g., there were a number of Burma selections in the importation from Ceylon.

110. The collection of 35 local upland rices was maintained, and additions have been received.

111. Nine samples of seed rice were sent to other countries on request.

112. Hybridization was successfully attempted this year. Rhind's method of emasculation was used, and a good proportion of seeds set. The main crosses were Toma 112 x Ngasein 57 and Kavunginpoothala 12 x India Pa Lil 46.

113. The progress of selection work in recent years is given in the following table:—

	1945	1946	1947	1948	1949	1950	1951
Toma ..	163	40	18	4	4	4	3
India pa lil	320	44	25	5	5	5	5
Kavunginpoothala	155	46	27	5	5	5	5
Indo-China	269	49	30	10	9	7	6
Ngasein ..	134	43	25	3	3	3	3
Pokkali ..	—	10	10	8	6	6	6
Toma ..	—	—	76	27	26	11	11
India pa lil ..	—	—	56	11	8	8	8
Yenti ..	—	—	85	33	25	6	1
Kalimodu ..	—	—	131	51	45	11	10
Lead ..	—	—	—	—	341	33	24
Sughandi ..	—	—	—	—	143	37	37
No. 79 ..	—	—	—	—	33	30	20
Kurulutuduwi	—	—	—	—	35	32	22
G.E.B. 24 ..	—	—	—	—	—	113	31

114. *Experiments on Water Control.*—With the exception of four farm blocks under the Agricultural Chemist's experimental drainage system, the whole farm remained tidal throughout the year. There was little sign of the toxicity which appeared when it was under water control, and it appears that it has largely been washed out.

115. On the four blocks on which water control was reinstituted, yields again declined despite the special drainage layout. The block with faggot drains was again the worst, due to over-drainage.

116. Two modified trials on water control were continued. Results so far are interesting but it is still too soon to draw any conclusions from them. A low bund to retain a few inches of tidewater appears to be very beneficial.

117. *Fertilizers.*—Growth in wet rice nurseries this year was very poor, but a top dressing of 2 cwt. Superphosphate plus 1 cwt. Sulphate of Ammonia per acre brought them on quickly. Late sown nurseries with the fertilizer applied at sowing, were ready to transplant in four weeks.

118. Applications of Superphosphate produced beneficial results; the economic dressing appears to be about 1 cwt. per acre.

119. *Farm Yields.*—The production of paddy on the farm was slightly less than last year due to a severe infestation of crabs which destroyed the seedlings immediately after transplanting. Crabs have not been troublesome in recent years, but this year they were very numerous and destructive.

120. *Other Crops.*—Fruit trees and other perennial crops were maintained, and an extension was made to the area under pineapples.

121. Improved varieties of cassava and sweet potatoes were maintained, and the oil-palm nursery was extended.

122. *Livestock.*—The small herd of Ndama cattle maintained good health throughout the year. With the increase in the number of houses now occupied on the station the grazing area for the cattle has been reduced and it is necessary to send them off the station for extra grazing.

EXTENSION WORK

123. *Swamp Clearance Schemes.*—Further progress was made with clearance schemes in mangrove areas. The Bakepet empolder in Avicennia mangrove land was extended by another 100 acres, bringing the total acreage to 205. This year approximately 100 acres were planted and good yields of rice were obtained.

124. An empolder of approximately 130 acres was begun in Samu Chiefdom. At Mapotolon, in the same chiefdom, the survey of another large area was begun by the Public Works Department with a view to empoldering 500 acres, using mechanical excavators.

125. Inland swamp clearance schemes functioned satisfactorily. A new one at Mintomo in Bure Makonte Chiefdom is in its first year of planting. Yields were good but only part of the 70 acres cleared was planted. Having seen this year's results it is probable that more enthusiasm will be shown by the farmers next year.

126. *Oil-Palms.*—A total of 15,600 seedlings was distributed, compared with 10,225 last year. All existing plantations of improved oil-palms were visited for collecting seed, which was subsequently planted at Rokupr, Port Loko and in Native Administration nurseries.

127. Some damage to seedling palms was done by "cutting grass" (*Thryonomys*) particularly in areas where grass was dominant. Little damage occurred where cassava had been planted.

128. *Irrigation and Drainage Schemes*.—Further improvement was apparent at Luti and Rosino after another year of free tidal wash. Local farmers planted a larger area with rice than last year and they have extended the cultivation of cassava round the edges of Rosino above the check bund.

129. *Mechanised Farming*.—Near Mange, in Bure Makonte Chieftdom, 80 acres of swampland were ploughed with a Fordson tractor on half-tracks at a cost of £2 8s. 9d. per acre. This, however, does not include depreciation on the tractor and implements. The ensuing rice crop was very good though a few farmers had failures owing to heavy falls of rain towards the end of May.

130. *Seed Multiplication and Distribution*.—520 bushels of pure seed grown on Rokupr farm were sold to farmers. 687 bushels were purchased from farmers for re-sale at planting time, and 41 bushels were available from Rosino. The total sales of seed rice were therefore 1,248 bushels.

131. *Pests and Diseases*.—There were no serious outbreaks of any pests or diseases of crops.

132. *Fertilizers*.—Small trial plots were laid down on farmers' crops within the Circle, on groundnuts, upland and swamp rice, cassava and bananas. Sulphate of Ammonia, Sulphate of Potash and Superphosphate were used at rates varying from 1–2 cwt. per acre. Results were inconclusive on upland rice, groundnuts and bananas. Dressings of 2 cwt. per acre of Sulphate of Potash on cassava and 2 cwt. per acre of Superphosphate on swamp rice produced marked responses.

SOUTH-EASTERN CIRCLE

Experimental Farm, Kenema

133. *Annual Crops*.—Measures designed to maintain fertility were continued as in previous years. Seed rice and vegetables, together with planting material of economic crops, were produced for sale within the Circle.

134. *Perennial Crops*.—Young plantations of coffee and cacao were maintained. They have not yet begun to bear.

Stock

135. *Cattle*.—The small herd of Ndama cattle was found to be showing signs of deterioration through inbreeding. A new bull was therefore introduced from Musaia to replace the old one.

136. *Pigs*.—Pig keeping was re-introduced by bringing in a Large White boar and two gilts from Newton. One gilt died from Trypanosomiasis, but the other one has done well and her litter has shown very satisfactory live weight gains.

137. *Poultry*.—There has been no increase in the numbers of the Rhode Island Red flock, due to heavy mortality among the chicks.

138. Local ducks have increased from six to thirty birds, and their egg production was 46 eggs per laying bird.

139. *Fertilizers*.—Fertilizer trials were laid down on various farm crops and produced very good results on swamp rice and cassava.

140. On swamp rice, a dressing of 2 cwt. per acre of Superphosphate gave an average increase of 760 lb per acre, representing a profit of £5 2s. 9d. The treated plots ripened earlier than the untreated ones.

141. On cassava, the increase in yield and profit per acre were as follows:—

<i>Fertilizer</i>		<i>Increase</i>	<i>Profit</i>
		lb	£ s. d.
2 cwt. Superphosphate	..	6,316	18 3 1
2 cwt. Sulphate of Potash	..	12,850	37 6 8
2 cwt. Superphosphate	}	19,384	57 17 5
2 cwt. Sulphate of Potash			

142. These trials were confined to small plots; the figures should therefore be treated with reserve. Further trials will be carried out on a field scale.

143. *Waiima Sub-Station*.—The work of building bunds and water channels was completed but trouble was experienced with the main sluice. This was not made sufficiently strong and was broken by the first heavy rains.

144. Considerable quantities of planting material were raised for distribution in Kono District.

EXTENSION WORK

145. *Swamp Development Schemes*.—The Giema scheme was re-started this year and about 100 acres were planted. After two years fallow the rice crop was very good and little response was obtained from the application of fertilisers.

146. *Native Administration Farm and Staff*.—Most of the Native Administration farms have now served the purpose for which they were started, i.e. the rapid dissemination of improved swamp rice varieties. The number of these farms has been reduced to eight, situated in areas where there is still a need for them. The rest are being used mainly for production of seed rice. Those which have been closed have been planted up as far as possible with improved oil-palms.

147. *Cocoa*.—There was a further expansion of the area planted with cocoa this year, amounting to 300 acres. This is not as much as in the previous two years, probably due to the reduction in the price of the crop.

148. Four departmental fermentaries were operated this season, with satisfactory results, which are tabulated below:—

Year	Wet beans bought lb.	DRY COCOA SOLD (lb.)				Total sold lb.
		Grade I	Grade II	Grade III	Grade IV	
1950	.. 11,449					5,218
1951	.. 51,164	9,020	4,210	1,954	2,119	18,052

149. *Coffee*.—There has been an increase in the area planted, particularly near the French Guinea boundary. High prices across the border have stimulated production.

150. *Oil-palms*.—Inadequate seed supplies have held up the production of improved oil-palm seedlings. The few plantations in bearing are being fully utilised and additional supplies have been obtained from Masanki.

151. Test plots of oil-palms planted in grasslands have not proved successful. Fire and damage by rodents have seriously depleted the plantations.

152. The Baoma Pioneer Oil Mill has proved a great success now that the local farmers have got used to the practice of selling whole palm fruit in quantity. A second mill is in course of erection in Niawa Chieftdom.

153. *Kenema Agricultural Show*.—This was first held in 1949 primarily as a Cacao show. Three shows have been very successful, and a number of other classes of agricultural produce are now included. This year's show was again a great success and an improvement in the average standard of cacao was noticeable.

BONTHE CIRCLE

EXTENSION WORK

154. *Mangrove Clearing Loan Scheme*.—In the course of the year £141 was issued in loans to 24 new farmers and to three who had previously received loans.

155. New fellings are estimated at 93 acres. Progress has been rather slower than usual this year.

156. *Riverain Grasslands*.—A Fordson County track-laying tractor was received in the latter half of 1950 and further extension of mechanical ploughing became possible.

157. Operations began in February and finished in May, after 282 acres had been ploughed. About 40 acres were lost for rice growing due to the early onset of the rains.

158. Some difficulty was experienced in getting enough ground cleared of the heavy growth of grass. Clearing had to be done by hand and proved very hard work.

159. A Wilder pitch-pole harrow was received late in the season. This implement gave very satisfactory results in breaking down the soil before planting.

160. Indo-China rice was planted in order to withstand the deep flooding and average yields were estimated to be 1,800lb. per acre. One selection from Rokupr Rice Research Station gave a yield of 2,880lb. per acre, which was 708lb. per acre better than the local strain on the same ground.

161. Costs, not including depreciation, worked out at £1 10s. 1d. per acre for ploughing and 11s. 2d. per acre for harrowing.

162. *Oil-palms*.—During the year 260 oil-palm seedlings were distributed, bringing the total issued since 1949 to 2,634.

163. Great difficulty has been experienced in getting spare parts for Miller nut crackers owned by Native Administrations.

164. *Piassava*.—Owing to a fall in price interest in the production of piassava fell off. Co-operative Societies in the Kwarko area have concentrated on the production of the Prime Sherbro grade and propaganda among other producers was continued in order to maintain the standard.

165. Work on the Piassava Experimental Station was begun, and building materials were collected. There is a great shortage of stone in the area, which makes building operations difficult.

166. *Copra*.—Small quantities have been prepared, but the high price of fresh nuts precludes any increase in its production.

167. *Fertilizers*.—The effects of Sulphate of Ammonia, Sulphate of Potash and Superphosphate on cassava were investigated. The most profitable dressing was 4 cwt. per acre of Superphosphate. This gave a return of 10,130lb. per acre, compared with 6,081lb per acre from the control. The next best dressing was 4 cwt. per acre Superphosphate plus 2 cwt. per acre Sulphate of Potash. This gave a return of 9,995lb per acre. No other dressings were found economical.

MAKENI CIRCLE

168. The average yield of rice varieties grown for distribution was 1,460lb per acre, which is an improvement on last year, when the yield was only 1,117lb. per acre. The average yield for the previous ten years was 1,452 bushels per acre.

169. The highest yielding rices were D.99, DC.39 and Sughandi. A new introduction to Makeni, PTB.15, did not do well.

170. The dry season crop of sweet potatoes (Mississippi var.) gave a rather better yield this year, though it was not outstanding.

171. Tobacco growing was continued, using Bourbon, Magnum Pryor, Jamaica hybrid and "Makeni hybrid". A new variety, Heavy Western, was introduced from Nyasaland. This is a pipe tobacco, and did not yield so well as the others.

172. Smoothe Cayenne pineapples continued to do well, and bananas have been revived with a heavy mixed dressing of fertilizers.

173. Most of the upland plots have by now been laid down to grass for grazing by cattle.

174. 28,500 oil-palm seedlings were distributed from the nursery, compared with 4,338 last year.

EXTENSION WORK

175. *Swamp Development Schemes*.—No new schemes were started but the schemes at Kamakwie, Yele and Pendembu worked well. Participants in them are beginning to appreciate the importance of early hoeing and incorporating the weeds into the soil. Yields have been between 1,200 and 1,500 lb paddy per acre.

176. At Binkolo, Kotohun and Makali the advantages of swamp cultivation are not yet appreciated, though yields on the parts farmed have been in the region of 1,100 lb per acre.

177. Masingbe and Mamansu swamps are not as fertile as the others, but there is an indication that they may respond to fertilizers.

178. The Model Holding at Kamakwie this year made a nett profit of £45, and also fed the holder from his four acres of land. Most of his profit came from two acres of swamp.

179. *Native Administration Staff and Farms*.—Most of these were closed down this year as they have by now fulfilled their purpose, which was to accelerate the distribution of swamp rice varieties. Two have been retained in backward areas a third as been turned into a District Council oil-palm nursery and two others are being used for raising economic trees.

180. *Ploughing*.—The use of oxen for ploughing in the Mabole valley was extended. There are now 22 farmers with complete outfits and it is estimated that they have ploughed a total of some 100 acres of rice land during the year.

181. Farmers in this area lost a number of cattle from Rinderpest last year. They were at first extremely reluctant to have their animals inoculated against the disease, but they are now beginning to appreciate the value of it.

182. Two boli lands (large inland swamps) near Mateboi were prospected during the year and soil analyses made. One, at Bantoro, appears promising for mechanised rice production and is part of an extensive swamp stretching apparently for some 30 miles. It is intended to start tractor ploughing there in 1952. It is probable that Superphosphates may be needed to get full value from these lands.

183. *Oil-palm Development*.—The raising and distribution of oil-palm seedlings showed a large increase over previous years. District Councils have taken a larger share in the work, but much of the actual work was done by departmental staff.

184. The progress of oil-palm distribution has been as follows:—

<i>Year</i>	<i>No. distributed</i>		
1948	..	..	2,000
1949	..	..	4,500
1950	..	..	12,100
1951	..	..	53,000

MUSAIA CIRCLE

185. *Animal Husbandry Station*.—The building programme is now practically completed. More land has been cleared for crops, and a trial has been made in connection with providing dry season grazing by means of irrigation from a stream.

186. *Cattle: Dairy Herd*.—Eight black cows were purchased for the dairy herd, in order to test last year's observation that dark-coloured cows are better than light-coloured ones.

187. The numbers in the herd increased from 59 to 79 during the year. Some low yielders were transferred to the beef herd.

The record of milk production is as follows:—

Year	Total Milk produced lb.	Average per Cow per Lactation lb.	Total Number of Cows Milked	Average Number of Cows Milked	Average Length of Lactation Days	Average Birth Weight of Calves lb.
1944	.. 10,136	390	26	8	152	30.3
1945	.. 12,356	722	16	9	203	34.1
1946	.. 13,955	1,077	18	8	337	35.0
1947	.. 15,925	1,108	18	9	294	35.4
1948	.. 16,917	1,225	21	10	285	38.1
1949	.. 19,202	1,381	19	10	263	39.1
1950	.. 17,714	1,151	18	11	237	40.7
1951	.. 20,655	927	21	12	197	41.7

It will be observed that the average performance per cow is less than in 1950, though the total production of milk and the birth weight of calves has gone up. This is due to a higher proportion of heifers, and culling of low yielders.

188. Sales of dairy produce were as follows:—

Year	Milk	Butter	Cream	Cheese
1949	.. —	657 lb.	27 lb.	36 lb.
1950	.. 664 lb.	644 „	52 pints	54 „
1951	.. 1,173 „	575 „	68 „	62 „

The demand for dairy product continues to exceed the supply.

189. *Beef Herd.*—The herd has continued to thrive under range conditions. Nine animals were purchased, and four barren cows were culled. The total head of stock increased from 60 to 77 during the year.

190. The following figures summarise the herd record:—

Year	Total Head	Live Weight Gain per Head per Month	Average Birth Weight of Calves
1949	.. 52	—	36.2 lb.
1950	.. 60	20 lb.	35.1 „
1951	.. 77	17 „	35.4 „

Regular weighing of grazing animals has shown that they gain in weight from February to September, but from October to January there is little increase.

191. Precautions were taken against Rinderpest by inoculating all cattle with Lapinised vaccine.

192. *Pigs.*—One boar and a gilt in-pig were introduced from Newton. The gilt produced a litter of eleven and is again in-pig. They are Wessex Saddleback breed, and there is every indication that they will do well.

193. *Poultry.*—Progress with Rhode Island Red fowls and Muscovy ducks was rather slow owing to an outbreak of Coccidiosis. Chinese geese, also from Newton, have done well.

194. *Crops.*—Annual crops, particularly maize, grow well at Musaia. A South African variety of maize gave 1,003lb. of grain per acre whereas a local variety only gave 276lb. Groundnuts yielded 439lb. of unshelled nuts per acre and rice, on land by no means ideal for it, gave 673lb of paddy per acre. Sweet potatoes produced 4,456lb per acre.

195. The collection of grasses now numbers fourteen varieties or strains, and these are being multiplied and planted out for grazing trials in the future. At present the local Guinea Grass, *Panicum maximum*, and dwarf exotic strains of it from Northern Australia are most promising.

196. The local cattle owners are showing interest in these grasses and it is hoped that when nomadic herdsmen settle, as they show every sign of doing, it will be possible to provide planting material of grasses known to be most suitable. Already some 90 acres on the station have been planted with different grasses of which the Guinea grasses are the most promising.

EXTENSION WORK

KABALA SUB-STATION

197. Wet and dry season rice were grown for seed and demonstration purposes.

198. The production of vegetables was reduced to allow more space for the production of more planting material, such as oil-palms, coconuts, oranges and pineapples.

199. A ploughing demonstration with tractor and ox-ploughs was held, resulting in an increased demand for ox-ploughs, and the services of a tractor. Twenty acres were tractor-ploughed for local farmers. The terrain is such that no large areas are available for mechanisation, but much can be done by encouraging ox-ploughing.

200. Rice yields were as follows in lb. per acre:—

	DRY SEASON			WET SEASON			
	No. 79	D.114	Lead	No. 79	D.114	G.E.B. 24	Sughandi
1950	.. 1,429	2,591	1,500	720	—	720	2,280
1951	.. 885	1,031	—	1,080	900	1,260	2,100

201. Distribution of planting materials was done on a larger scale, as shown below.

	<i>Oil-palm</i>	<i>Pineapples</i>	<i>Coconuts</i>	<i>Orange</i>	<i>Rice</i>	<i>Miscellaneous</i>
1950	.. *1,928	*224	*550	—	—	—
1951	.. 1,609	158	249	152	4,560 lb.	51

* Supplied to Stock Farm.

COLONY CIRCLE

EXPERIMENTAL STATION, NEWTON

202. The policy on the farm has not been changed. Stock farming combined with intensive valley cultivation under irrigation, development of anti-soil erosion measures and the establishment of pastures and tree crops on the upland are the main objects.

203. *Cattle*.—The herd of Ndama cattle now numbers 31. A fresh bull was brought in from Musaia and the poorest animals were culled. The herd thrived well and fulfilled their role of manure makers admirably.

204. *Pigs*.—The Wessex Saddleback boar and one sow died from Trypanosomiasis. Two sows aborted, probably through the same cause. Injections of Antrycide were administered to all pigs and there has been no further trouble. The stock of pigs at the end of the year was 86. During the year, 46 were sold for breeding, 53 for pork and three died.

205. The average size of litters at birth was 10.9 and the average number reared was 6.5. This was not as good as in previous years, probably due to Trypanosomiasis. The average birth weight and average weight at weaning were 2.9lb. and 28.3lb. respectively, per pig.

206. Feeding stuffs were not easy to obtain and, owing to increased cost and higher labour rates, the profit on pigs was only £174, compared with £378 in 1949. The gross revenue in both years was about the same.

207. *Poultry*.—The breeding and distribution of Rhode Island Red fowls, which began in 1940, was continued. 85 cocks and 2,781 eggs for hatching were sold in the course of the year. In 1950, the figures were 49 and 1,430, respectively. An outbreak of fowl pest at the beginning of the rains killed off a number of birds but in spite of this, and of heavy mortality among chicks, it was possible to increase the total head of fowls from 306 to 475 by the end of the year.

208. Egg production improved from 52 to 71 eggs per bird but the hatching percentage was low, largely due to infertile eggs.

209. Local Muscovy ducks did better than Khaki Campbells and Indian Runners. The imported ducks were very disappointing, they laid but few eggs and most of those were infertile. There was heavy mortality among ducklings up to the age of six weeks. It appeared to have been mostly due to *Salmonella* infection.

210. Chinese geese imported in 1950 were more promising than ducks. Ten adult geese laid 263 eggs. Out of 194 set, 106 goslings were hatched, but as in the case of ducklings, there was heavy mortality in the first few weeks. Fertility of the eggs was variable, possibly due to their being kept too long before being set for hatching. Eleven goslings and 62 eggs were distributed to other Agricultural Stations.

211. *Small Livestock*.—There was a stock of 26 rabbits and 27 Guinea pigs at the end of the year. The Veterinary and Medical Departments took 46 rabbits and 37 were sold for breeding purposes. The demand for Guinea pigs was small but steady. The Medical Department took six and 46 were sold for breeding.

212. *Crops: Valley Cultivation*.—Intensive cultivation with rice in the rains and vegetables under irrigation in the dry season, continued with very satisfactory results.

213. In one valley which is crossed by a public road, a model holding has been established. It consists of two-fifth acre of swamp, one-and-a-quarter acres of terraced upland and three acres of bush, and includes a dam from which water is available for irrigation in the dry season. In 1952 it is intended to establish pigs and poultry on the holding.

214. The holding is worked by a local farmer, his wife and son, and careful accounts are kept in order to discover the economics of such a holding in the Newton area. The farmer entered into occupation in May and from then until the end of the year a record of income and expenditure was kept. The results were as follows:—

<i>Revenue:</i>					£	s.	d.
Income sale of produce	..	..	..	..	..	10	2 8
Valuation on 1st May	..	£22	1	6	..		
31st December	..	£36	4	0	..		
Increase in valuation	..	..	..	..	..	14	2 6
					£24	5	2

Expenditure:

					£	s.	d.
Paid labour (subsidised)	..	..	..	..	..	26	12 6
Seeds	..	..	..	..	..	2	8 4
Sundries	..	..	..	..	..	0	14 6
					£29	15	4

215. *Upland Cultivation*.—The degraded upland soil of the Eastern Colony area still presents many problems. Farmyard manure and fertilizers have produced results on small-scale trials, and it will now be possible, by using mechanical equipment, to carry out trials on a field scale. It is possible to establish good fodder grasses which, after grazing by cattle, can be ploughed under and thereby incorporate some humus with the soil. The extensive use of farmyard manure, supplemented with fertilisers, seems to be the only solution to the satisfactory growth of annual crops.

216. *Fertilisers*.—Trials were carried out on cowpeas, fundi, upland rice, ginger, cassava, groundnuts, pigeon pea and sweet potatoes. In nearly every case, farmyard manure and complete fertilizer dressings (N.P.K. combined) gave the best results.

217. *Mechanisation*.—A Ferguson tractor and a complete set of implements were received late in 1950. This equipment has made it possible to prepare and transport large quantities of farmyard manure and compost, and to carry out efficient cultivation at a reasonable cost. The hammer mill has been invaluable for preparing food for livestock.

218. *Economic Tree Crops*.—Cashew, avocado pears and citrus yielded heavy crops. There are now 32 acres of improved oil-palms established. A number of replacements have been necessary to make good damage by rodents. Inter-cropping with pigeon peas, groundnuts and Musaia cowpeas reduced the damage which was most severe where palms had been planted in lanes cut through uncleared land.

EXTENSION WORK

219. *Reclamation of Saline Swamps*.—*Maswari*.—The 4-acre empolder made in 1938 was tractor-ploughed in the dry season with satisfactory results. A dressing of 2 cwt. each of Sulphate of Ammonia and Superphosphate, with $\frac{1}{2}$ cwt. Sulphate of Potash per acre, was applied at planting time. Yields of paddy averaged 1,502 lb. per acre and would probably have been higher but for an attack of stem-boring caterpillars. Last year, the yield was 1,211 lb. per acre.

220. 59 acres of empoldered land were rented at 7s. 6d. per acre to local farmers, whose yields varied from 720 to 1,000 lb. paddy per acre.

221. Fertilizer trials were carried out on farmers' land and it was found that a complete dressing of 1 cwt. per acre each of Sulphate of Ammonia and Superphosphate with $\frac{1}{2}$ cwt. per acre of Sulphate of Potash, gave the best results. The increase was 270 lb. per acre, which was only just economic.

222. *Wellington*.—25 acres were rented by local farmers, who harvested 600 to 1,200 lb. paddy per acre. Applications of 2 cwt. per acre of Superphosphate produced increases in yields of the order of 33 per cent.

223. Applications of lime improved enormously the yield of rice. The best dressing was 3 tons per acre, which gave 1,680 lb. of paddy per acre, compared with 80 lb. per acre from control plots. Unless there is a good residual effect, such a dressing is not economic. The cost of the lime was about double the value of the crop.

224. *Waterloo Oil-palm Plantation*.—This year, 300 acres were planted up with improved oil-palms. The work was started in 1949, the object being to plant up 1,000 acres on the old airport. The total area now planted is 330 acres and the establishment rate for transplanted seedlings is 50 per cent. On uncleared ground rodents are responsible for most of the failures.

225. A total of 16,900 oil-palm seedlings were distributed for planting by farmers.

226. *Pigs*.—A survey at the end of the year revealed that in the Colony area there were 36 farmers owning 320 Newton pigs or their progeny, 16 more farmers have accommodation for pigs, but have temporarily given up pig keeping owing to feeding difficulties.

227. It is hoped that a groundnut oil expressing plant will be established by the Department of Commerce and Industry towards the end of 1952. This should materially improve pig keeping extension by providing ample groundnut cake.

C—NJALA TRAINING COLLEGE FARM

228. Mr. E. H. Nichols was the Agricultural Officer responsible for agricultural training throughout the year. During his absence on leave, Mr. G. C. Taylor continued the work.

229. The students received talks on Agricultural subjects from four officers of the department and farm classes were held on different sections of the Departmental Farm. They were also given practical work with a Ransomes M.G. 5 crawler tractor an excellent machine for teaching purposes. In the latter half of the year, the junior students were taken on a two-week tour of the cocoa areas, visiting plantations and central fermentaries.

230. Throughout the course of training, every effort is made to put into practice the precepts taught in the classroom and in this connection, the College Farm, though small, is an invaluable asset.

231. *Livestock*.—On the College Farm, the livestock section was enlarged. Buildings were constructed by the students to house a Large White gilt and rabbits from Newton. An additional seven birds were put into the flock of Rhode Island Red fowls, which also entailed the construction of more accommodation.

232. The gilt farrowed eleven piglets of which four were culled early. Two boars and one gilt were selected for breeding purposes later and the remaining three boars were castrated. These, with one gilt, are being raised for pork. The progress of all the animals has been very satisfactory, and students have taken great interest in them.

233. *Crops*.—The crops grown are as varied as soil conditions permit and, as far as possible, are representative of those generally grown throughout the country. The farm is laid out on sloping land in contoured strips. Every second strip is planted with a permanent crop and the intermediate ones are available for annual crops. These are worked in turn and followed by a fallow period under grass. Thus it provides a visible example of an ideal layout which checks soil erosion and is adaptable for any type of upland farming which it is wished to demonstrate. The Agricultural Students carried out all the work on the farm and in addition all students cleared and stumped half an acre of ground to provide vegetables for the students' mess.

234. A fertilizer experiment on upland rice was carried out and interesting results were obtained. This was an experiment designed to test the effects, on two varieties of upland rice, of dibbling versus broadcasting the seed, and the application to each variety of 4 cwt. per acre each of Superphosphate and Sulphate of Ammonia.

235. The application of fertilizers increased the yield of both varieties by very nearly equal amounts, namely 629 lb. per acre, and dibbling gave higher yields than broadcasting.

236. The highest total yield was from dibbled Bundubai rice, receiving fertilizers, which gave 2,081 lb. per acre. The lowest yield for this rice was 24 lb. per acre on the broadcast plots which were not fertilized.

237. The Glaberrima variety gave 1,549 lb. per acre from the best plot, which was dibbled and received fertilizer. The lowest yield of this variety was 755 lb. per acre from the dibbled control plots.

D—HORTICULTURAL SECTION

238. The Horticulturist, Mr. H. D. Tindall, transferred from Njala to Freetown in March. He has made his headquarters in the Agricultural Department Office in New England where a small experiment station has been established. It is here that experimental work on economic plants and trials of new introductions is carried out.

239. Vegetable demonstration gardens have been laid out at Lumley and Gloucester, in order to show the effects of improved methods of cultivation and to demonstrate new varieties.

240. At Lumley, also, a nursery for the propagation of economic plants has been established. 3,000 sour orange seedlings have been planted out for future budding with citrus fruits. Two large Nissen huts have been erected for use as stores.

241. Lectures and practical demonstrations have been given in vegetable growing areas, and advisory visits to individual growers have been made. The interest of the general public has been aroused by talks over the radio rediffusion service and by articles in the local press.

242. A vegetable growers' Co-operative Marketing Society was formed in the latter part of the year. The object was to secure more favourable prices for both grower and consumer. This end was achieved, but some difficulty was experienced in obtaining transport and keeping the members to a definite time-table. £124 worth of vegetables were sold in sixteen weeks.

243. Numerous ornamental plants were sold and a number were added to the collection, some being new introductions. In all, 1,360 ornamental plants of 78 varieties were distributed.

244. Fertilizer trials on vegetables showed that a complete dressing of 1 oz. per square yard of each fertilizer was most beneficial. Yields of beans and lettuce were doubled. Sulphate of Potash was particularly beneficial to lettuce; a dressing of 1 oz. per square yard of this alone produced very rapid development in a short time.

(e) RESEARCH

PLANT PATHOLOGY SECTION

245. The Plant Pathologist, Mr. F. C. Deighton, O.B.E., reports as follows:—

“(1) About 900 collections of fungi were made during the year and sent to the Commonwealth Mycological Institute, duplicates being placed in the herbarium at Njala. Thanks are due to the staff of the Commonwealth Mycological Institute for identification of many of these and for assistance with others, and to Miss E. M. Wakefield for identification of a number of Resupinates and Polypores.

(2) Early in the year, the Agricultural and Forestry phanerogamic herbarium at Njala was handed over to the Systematic Botanist and Ecologist. Some 370 phanerogamic collections were made by the Plant Pathologist during the year, mostly in connection with identification of host plants of fungi, and sent to the Royal Botanic Gardens, Kew, duplicates being placed in the herbarium at Njala.

(3) It is noteworthy that in 1951 Agarics and Lycoperdaceae were relatively uncommon around Njala whereas in 1949 several species were abundant on the lawns here. The large sclerotial strain of *Rhizoctonia* (“*R. solani*”) was very common on leaves of a number of grasses at Njala during 1951.

(4) *Beans*.—*Isariopsis griseola* Sacc. was recorded for the second time in Sierra Leone in October at New England, Freetown, causing a plentiful angular leaf spot on Black Sinebone Bean (*Phaseolus vulgaris* var.) recently introduced from British Guiana. Since its first record in 1949, this fungus has not been seen again at Njala, nor has it appeared in other parts of Sierra Leone except for the above record.

(5) *Citrus*.—Small outbreaks of Scab (*Elsinoe fawcettii* Bitanc. & Jenkins) occurred in the nursery at Njala during the year and were dealt with. A severe outbreak in the nursery at Newton Agricultural Station early in the year was dealt with effectively by destruction of all sour orange seedlings in the area affected and severe pruning of budded plants there, and temporary removal of citrus propagation work to another part of the farm some distance away.

(6) *Groundnut*.—Agricultural Officers, especially Mr. T. S. Jones in the South-eastern Circle, assisted by sending about 100 collections of groundnut (“Kono” variety in most cases) leaf spots mostly between March and October. *Cercospora arachidicola* Hori. was present on about 80 per cent of these collections, *C. personata* (Berk. & Curt.) Ell. & Ev. on 10 per cent, while the remaining 10 per cent showed both species of *Cercospora*.

(7) Records show that a defoliation, often quite severe, occurred regularly on groundnuts on the Agricultural Experiment Station at Njala at least up to 1937, becoming severe (on plants sown in May-June) usually about the second to fourth week in August (second week in July in 1937). Since that date, except for a defoliation in January-February, 1946, on a nursery plot of a South African groundnut variety sown September-October, 1945, there has been no record of groundnut defoliation at Njala. These defoliations were all caused by *Cercospora personata*.

(8) It seems probable that the short duration (3½ month) Kono groundnut variety (of local origin) which is now almost exclusively grown in Sierra Leone in place of the longer duration (5-month) local strains which were more generally cultivated up to the late 1930's, escapes severe *Cercospora* attack because of its quickness of maturity. Plots of Kono groundnut at Njala sown mid-May showed plentiful *C. arachidicola* leaf spots by the time they were harvested at the beginning of September, 1951, but no *C. personata*.

(9) *Grasses*.—A large sclerotial strain of *Rhizoctonia solani* group was very common on the leaves of the two dwarf Guinea Grass varieties (*Panicum maximum* var. *pubiglume* C.P.I. 8387 and *P. maximum* var. C.P.I. 8389) grown on fodder plots at Njala in the wet season of 1951, causing extensive white blotches on the leaves and withering. This same *Rhizoctonia* strain was also isolated from common white leaf blotches on *Axonopus compressus* and *Cynodon dactylon* on lawns at Njala, and similar leaf blotches on *Axonopus africanus* and *Schizachyrium brevifolium* in these lawns were also assumed to be caused by this fungus.

(10) In December (the beginning of the dry season), this same strain of *Rhizoctonia* formed thin cobwebby mycelial mats a foot or more across over lawns, both at Njala and Rokupr, which by then consisted mainly of moribund *Schizachyrium brevifolium* and living *Desmodium triflorum*. Little harm to the grasses or to the *Desmodium* was apparently caused, though at Rokupr it was reported that *Axonopus* leaves were killed and at Njala the common lawn weed *Blepharis maderaspatensis* was killed (probably by *Rhizoctonia* though isolations from this plant were not attempted).

(11) This strain of *Rhizoctonia* only occasionally forms sclerotia in the field.

(12) A *Sphacelia* sp. was very common during the year in the ovaries of all varieties of *Panicum maximum* at Njala. During the dry season, the *Sphacelia* is usually overgrown by *Cerebella andropogonis* Ces.

(13) *Maize*.—*Puccinia polysora* Underw. was recorded commonly in most parts of Sierra Leone during the year, but never caused severe damage. Native maize plots in the Colony in July-August showed numerous rust lesions on the older leaves but these were of negligible importance. Native maize plots between Port Loko and Mahera were inspected in early December, just before flowering and only a light attack of *P. sorghi* Schw. could be found.

(14) *Rice*.—After an absence of two years there, *Ephelis pallida* Pat. (*Balsania* sp.) appeared again at Rokupr Agricultural Experiment Station in November, 1951. The following rice varieties were attacked: D. 99, Ngasein 57, Toma 112, Indo-China 70, and Kavunginpoothala 12. In the most severe attacks, on D. 99 and Indo-China 70, only about ½-1 per cent of the panicles on the plots were affected (though to the eye the attack appears to be much more serious), while on the other varieties only one or two panicles on each plot were infected.

(15) *Ephelis pallida* was recorded at Rokupr on the following wild grasses growing near the rice plots: *Panicum laxum* and two forms of *Paspalum commersonii*. A new wild host record from Sierra Leone of this fungus was on *Acroceras zizanoides* at Mahera in December.

(16) *Rose*.—A *Cercospora* leaf spot is very common on the older leaves of ornamental Rose bushes in the Protectorate (Njala, Makeni, Rokupr) and at Newton in the Colony. This fungus has not, however, been seen on Roses in Freetown. *Diplocarpon rosae* Wolf (conidial) was seen commonly on leaves of Roses in Freetown and at Waterloo, but has not yet been seen in the Protectorate.

(17) *Minor new Sierra Leone records of fungi* include *Leveillula taurica* (Lev.) Arn., on leaves of Jakato (*Solanum incanum* var.) and *Solanum macrocarpum* at Njala; *Puccinia purpurea* Cke., on *Sorghum alnum* introduced recently as seed from Argentine (this rust has not yet been recorded on cultivated or wild Sorghums in Sierra Leone); *Hemileia buntingii* Wakef & Hansf., on *Strophanthus sarmentosus*.

(18) *Publications*.—Puccinosira mitragynes and P. anthocleistae. Kew Bulletin, 1951, p. 138.

New African Meliolaceae. Sydowia, 5, 1951, pp. 1-8."

AGRICULTURAL CHEMISTRY SECTION

246. The Chemist, Mr. C. J. Piggott, took up duty in early September after the post had been vacant for more than a year. On his arrival, the staff consisted of one Laboratory Assistant and one Laboratory Attendant. Early in October, the Laboratory Assistant, Mr. H. O. Jarrett, left for the United Kingdom to read for an Honours Degree in Agricultural Chemistry, so that the staff position at the end of the year was identical with that noted in the 1949 report of this department. It has been impossible to recruit Laboratory Assistants of the required educational standard and Laboratory Attendants need constant supervision. The scope of laboratory work is, therefore, at present severely limited. The Chemist reports as follows:—

"General Research:

(1) During the period when the post was vacant, most of the chemical files were lost. The only extant record of previous experimental work is in the Annual Reports and so it has been impossible to continue the previous lines of work. Some of the work on swamp rice is continuing but as this will shortly come under the Rice Research Station, Rokupr, the emphasis is being placed on Soil Fertility with reference to upland crops.

(2) In view of the possible development of the "Boli" lands in the region of Batkanu by mechanical cultivation, a large number of soil samples were taken and analysed. The "Bolis" are large areas of flat land, flooded to some depth during the rains but very dry at other times. The natural vegetation is short grass and sedges of many different species. When wet the soil is dark brown to black (Munsell colour 5YR—3/1) and when dry, grey to greyish white (Munsell colour 10—YR—7/1) for a depth varying from six inches to two feet. Under this is a pale grey sandy clay. The organic matter content is variable but the texture is invariably a friable loam. Rice yields on these soils are known to be high but there has been little cultivation. This is due to the low population density possibly caused by an acute shortage of water in the dry season. The use of mechanical cultivation should enable the farmers to increase the area under rice nearly ten times.

(3) An intensive study of the salt content of Great Scarcies River was made at the beginning of the rains to determine whether it can be correlated with the rainfall figures. At the beginning of the rains, early May, the salt content dropped rapidly at all places, from Rokupr to the sea. By May 16th, the level of salt was below the maximum salt tolerance level for swamp rice (one per cent) and by mid-June was down to 15 p.p.m. Rainfall data for the area is meagre but it appears that the salt level fell below one per cent after about 10" of rainfall.

(4) Other analyses were made of (1) samples of Cassava Flour for Newton Farm and (2) many water samples from the Sewa River for the Public Works Department in connection with Bo water supply.

Fertilizer Trials:

(5) The following are the results of two experiments carried out at Njala:—

(a) Statistical experiment on Guinea Grass, Njala, third year. Layout. Two blocks of four plots.

Treatments: (2) Control, (2) 2 cwt./acre Sulphate of Ammonia

(3) 2 cwt./acre Superphosphate

(4) 2 cwt./acre Sulphate of Ammonia plus 2 cwt. Superphosphate.

Time of application: June 6th, 1950 and July 20th, 1951.

Yield in pound/acre green grass:—

<i>Treatment</i>			16th March, 1951	17th October, 1951	Total
Control	..	..	2,888	19,248	28,136
N	..	..	10,808	29,992	40,800
P	..	..	13,664	22,408	36,072
NP	..	..	10,560	25,864	36,424
Total			37,920	97,512	141,432

No difference is significant but there is an indication that both nitrogen and phosphate are limiting factors.

(b) Trial on Groundnuts (Kono variety).

Plot size $\frac{1}{2}$ acre.

Treatments: Section 1.—P = 3 cwt./acre Superphosphate
 K = 3 cwt./acre Sulphate of Potash
 N = 3 cwt./acre Sulphate of Ammonia } In all combinations

Section 2.—P = $1\frac{1}{2}$ cwt./acre Ammophosphate
 K = 3 cwt./acre Sulphate of Potash
 N = $2\frac{1}{4}$ cwt./acre Sulphate of Ammonia } In all combinations

Increases due to Treatment in lb./acre:—

	<i>Dry Fruits</i>		<i>Decorticated Nuts</i>	
Section 1.—N =	+64	= 15.3%	—192	—80%
P =	+8962	= 215.3%	+64	+26.6%
K =	+17284	= 415.3%	+576	+240.0%
Section 2.—N =	—20	= —86.9%	0	0
P =	—10	= —43.4%	+3	+29%
K =	—52	= —266.2%	—34	—330%

The Nut/Shell ratio varied from 20 per cent to 170 per cent. These results are very uneven although the yields are quite good. It is tempting to assume that Ammophosphate is the factor causing the reverse responses in Section II, or that there is some other factor in Superphosphate of high nutritive value, such as Calcium Sulphate."

SYSTEMATIC BOTANY AND ECOLOGY SECTION

247. The Systematic Botanist and Ecologist, Mr. D. Small, reported as follows:—

"(1) The work of the Systematic Botanist and Ecologist was to include ecological and vegetational studies in forest composition and the geographical distribution of economic tree species, combined with an economical study on the composition and utilisation of grassland, cocoa cultivation and some grazing problems; the collection of plant material for despatch to the Royal Botanical Gardens, Kew, for identification and inclusion in the revised Flora of West Tropical Africa.

(2) During the first period of the year, the Herbarium cupboards were transferred from Plant Pathologist's laboratories to a new Herbarium room. Carpological collections were dismantled from the library and rehoused in new quarters. Some 16,000 specimen sheets were transferred together with 5,000 bottles of carpological specimens which were rehoused, labelled, checked and registered.

(3) Laboratory benches, Herbarium tables and Museum cupboards were constructed, repaired and stained to enable the increased intake of plant material to be dealt with in poisoning, determination, mounting and despatch to Kew.

(4) During the period 17th September to 14th October a survey and collection was made in the Sulima Chiefdom of the Northern Province over the proposed Fula cattle settlement area. This area proved very disappointing owing to the dominance of coarse unpalatable grazing grasses, such as *Chasmopodium caudatum* and *Hyparrhenia rufa*, under a very open canopied tree zone with some species such as *Uapaca guineensis*, *Terminalia* sp. and *Piliostigma* sp. The more palatable and succulent grazing grasses such as *Andropogon tectorum* and *A.gabonensis* were confined to a small area in the north under more heavily shaded conditions. The area was very degraded, with seasonal overgrazing, firing and drought. Aerial photographs confirmed the prevailing poor vegetative condition.

(5) A transect survey was begun on the 29th of October at Njala in plot 26, to plot and determine the dominance of *Panicum laxum* over the introduced dwarf Guinea grass *Panicum maximum* var. (CP1 8389) from Queensland, Australia. The plotting is now completed, a stock map prepared and a report is nearing completion. Records of the past treatment are being examined to obtain figures of yield per plot examined. The present result indicates that fertilizer treatment has enabled the dwarf Guinea grass to establish but *Panicum laxum*, the dominant in the control plot, has spread to those fertilised plots and is apparently suppressing the dwarf Guinea grass. Also species such as *Axonopus compressus*, *Schizachyrium brevifolium* and *Borrea stricta* are common throughout the plot. The control plots show as little as one per cent of dwarf guinea grass and 60 per cent *Panicum laxum*, with sub-dominant *Schizachyrium brevifolium*.

(6) The vegetational study of mangrove clearance and swamp reclamation by the Malaria Control Unit at Aberdeen was continued, with further collections from the original mangrove swamp and the *Cyperaceae* association found in the reclaimed areas. The planting of *Melaleuca leucodendron* by the Forest Department in these areas was studied, and pH values were recorded. The figures show that a saline condition still exists in one bund now eight years old.

(7) *General Research Progress—Herbarium.*—(a) The work of determinations and the despatch of collections were continued and some 2,800 specimens were despatched to the Director of the Royal Botanic Gardens, Kew, for determination and record for the New Flora of West Tropical Africa. In making these collections the following officers collaborated: Messrs. F. C. Deighton, H. D. Jordan, P. Adames, T. S. Jones and H. D. Tindall of the Agricultural Department and A. C. Frith, G. E. Crichton and J. L. Ross of the Forestry Department.

(b) The despatch of *Aloe barteri* to Mr. Reynolds of South Africa for inclusion in the records of the aloes of Africa, resulted in a gift of some 30 new *aloe* species, the seed of which were sent to Mr. H. D. Tindall, the Horticulturist, Freetown, who reported good germination."

ENTOMOLOGICAL SECTION

248. The Entomologist, Mr. F. A. Squire, was transferred to the Gold Coast in January, 1952. Unfortunately, he was unable to write a report before he left.

G. W. LINES,
Director of Agriculture.

DEPARTMENT OF AGRICULTURE,
NJALA, via MANO.

G.P. 1535/53/375/7.53.

